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URBAN AND REGIONAL LAND USE ANALYSIS:  
CARETS AND CENSUS CITIES EXPERIMENT PACKAGE

SKYLAB/EREP INVESTIGATION NO. 469  
NASA Order #T-5290 B

MONTHLY PROGRESS REPORT, NOVEMBER, 1973

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Geographic Applications Program  
Reston, Virginia 22092

November 20, 1973

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Monthly Progress Report: November 20, 1973  
Investigation No. 469

a. Overall status, including problem areas and significant progress to date:

The Geographic Applications Program moved from downtown Washington to the new USGS National Center in Reston, Virginia on November 16, 1973. The new address of the Skylab team for Investigation No. 469 is:

USGS National Center  
Mail Stop 115  
Reston, Virginia 22092

The Skylab investigation suffered a slight delay because of the disruption of the move and the readjustment in the new location; however, this should be more than compensated by improved efficiency resulting from proximity to other USGS units cooperating and collaborating on Skylab.

To date, the Census Cities portion of this experiment has received SL-2 S-190A camera coverage for all bands in 70 mm format for Phoenix, Tucson, Peoria, Cedar Rapids, San Bernardino/Riverside, and San Francisco. In addition, we have received 9 x 9 inch enlargements of S-190A imagery for all of the above test sites, except San Bernardino/Riverside, plus Washington, D.C. Earth Terrain Camera coverage has been received for Peoria and Cedar Rapids only.

We have received 8 x 10 press release color prints of SL-3 Earth Terrain color imagery and portions of color transparencies for the Phoenix and Washington, D.C. test sites. These were given to Valerie Milazzo by Dr. Wilmarth during her recent trip to Cape Canaveral to attend the pre-SL-4 launch news conference. This imagery does not constitute fulfillment of the required NASA SL-3 data shipment, which we hope to receive soon.

Color print enlargements at 1:100,000 scale from 70 mm 9 x 9 inch color transparency enlargements are being ordered for all test sites for which imagery has been received. In addition, false color infrared prints and transparencies are being made from the appropriate 9 x 9 inch black-and-white spectral bands for selected

test sites. The color enlargements and color IR images will be used to facilitate data analysis.

Land use and change detection analysis are underway using S-190A color imagery of the Phoenix test site. Enlargements at 1:100,000 scale are being analyzed. Preliminary findings indicate that S-190A imagery can be used to update portions of an existing 1970 high flight photo-derived land use data base. Evaluation of Skylab imagery for urban land use change detection in other test sites is planned. Results are documented in section "d" of this report.

- b. Recommendations concerning decision and/or actions required to ensure the attainment of the experiment's scientific objectives.

No additional recommendations since those noted in the last reporting period.

- c. Expected accomplishments during the next report periods.

We plan to continue and intensify the land use analysis of Skylab S-190A imagery and expand the number of test sites under study for which we have received Skylab data. We anticipate more comprehensive urban analysis of the newly acquired S-190B imagery for some of our test sites.

- d. Significant results and their relationship to practical applications or operational problems.

During this reporting period, work was concentrated on the analysis of the SL-2 S-190A imagery for the Phoenix test site. Land use interpretation and change detection analysis were performed using 1:100,000 photographic enlargements of a portion of the S-190A 70 mm color transparency. Comparisons were made between the 1973 Skylab imagery and the 1970 and 1972 land use data base for a 20 x 20 km area west of Phoenix to determine if changes in land use could be identified from the Skylab imagery. Results of this study were given verbally to Dr. Wilmarth by Valerie Milazzo at the time of the Skylab-4 news conference in Cape Canaveral. A summary of the significant findings to date is given below.

Areas of post 1970 and 1972 land use changes were identified solely from the Skylab imagery from comparisons with 1970 land use map. Most land use changes identified involved transition from agriculture to single family residential land use. The second most

prominant changes identified from the Skylab imagery were areas presently under construction. Post 1970 changes from Skylab were compared with the 1972 changes noted from the high altitude photographs. A good correlation existed between the change polygons mapped from Skylab and those mapped from the 1972 high altitude aerial photos. In addition, there were a number of instances where additional built-up land use not noted in the 1972 aerial photo as being developed were identified on the Skylab imagery. While these cases have not been documented by field observation, by correlating these areas with the appearance of similar land use areas whose identity has been determined, we can safely say that we have been able to map further occurrences of land use change beyond existing high altitude photo coverage from the Skylab imagery. From this we conclude, that Skylab data can be used to detect areas of land use change within an urban setting and can be of great value in updating the existing land use data base.

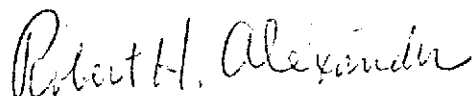
e. Summary outlook for the remaining effort to be performed.

The results obtained from the analysis of the SL-2 S-190A imagery reported above indicate an optimistic outlook for the remaining effort of land use analysis from the photographic sensors of Skylab. The outlook for the land use climatology portion of this experiment is going to depend heavily upon receipt of usable thermal data from the S-192 scanner, which thus far has not been available.

f. Travel summary and plans.

Valerie Milazzo traveled to Cape Canaveral November 12 to attend the press briefing held prior to the launch of SL-4. Samuel Outcalt and John Lewis traveled to the Lawrence Livermore Laboratories, University of California, Livermore; the Division of Environmental Studies, University of California, Davis; and Department of Earth Sciences, University of California, Riverside, to coordinate the numerical modeling and data processing phases of the land use climatology experiment with other research centers involved in similar work. This trip also permitted direct exchange of data and procedures with Robert Pease at Riverside, the third investigator on the climatological portion of the Skylab experiment.

Approved:



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Principal Investigator  
SKYLAB/EREP INVESTIGATION NO. 469